PHYSICS TARGET PAPER 2023

CLASS 12

CHAPTER NO.11 || HEAT	
SHORT Q/A	1. State 2nd law of thermodynamics. Explain the equivalence of both statements. 2. On the basis of kinetic molecular theory prove that $T \propto \frac{1}{2}m\overline{v^2}$
LONG Q/A	1. Define Carnot Engine. Explain Carnot Cycle. 2. State First law of thermodynamics and explain on its basis.(i) Isothermal process (ii) Isobaric process (iii) Adiabatic process. 3. Define molar specific heats and prove that Cp-Cv=R
NUMERICALS	**Textbook:** 11.2,11.3,11.4,11.9,11.11 **Past Paper:** 2013 Q.2(x), 2011 Q.2(vi)
CHAPTER NO.12 || ELECTROSTATICS	
SHORT Q/A	1. Prove that 1 volt/meter= 1 newton/coulomb, name the physical quantity which has these units. 2. Derive expression for equivalent Capacitance when three capacitors are connected in series and parallel.
LONG Q/A	1. State Gauss' Law. Apply it to find expression to show the electric field due to sphere of charge. 2. Define Compound Capacitor. Derive Expression for the capacitance of parallel plate capacitor when (i) Air is filled between plates (ii) Dielectric medium is filled between plates
NUMERICALS	**Textbook:** 12.2,12.6,12.9,12.11,12.16,12.17,12.19,12.20 **Past Paper:** 2019 Q.2(ix),2015 Q.2(x)
CHAPTER NO.13 || CURRENT ELECTRICITY	
SHORT Q/A	1. Derive expression for equivalent resistance when three resistors are connected in series and parallel. 3. Define emf. Derive relation between emf and potential difference.
NUMERICALS	**Textbook:** 13.2,13.7,13.15,13.16,13.17,13.18,13.19,13.21 **Past Paper:** 2019 Q.2(viii), 2017 Q.2(xii)
CHAPTER NO.14 || MAGNETISM & ELECTROMAGNETISM	

SHORT Q/A	1. Derive expression for magnetic field due to Toroid. 2. Derive expression for the experienced by a current carrying conductor in magnetic field.
LONG Q/A	1. Describe a method for determine the charge to mass ratio of electron. Derive relevant expression. 2. State Faraday's Law of electromagnetic induction. Explain Mutual and self induction with units.
NUMERICALS	**Textbook:** 14.2,14.5,14.8,14.10-14.15 **Past Paper:** 2018 Q.2(xii), 2011 Q.2(xiii)
CHAPTER NO.15 ‖ ELECTRICAL MEASURING INSTRUMENTS	
SHORT Q/A	1. Define Ammeter. How a galvanometer is converted into Ammeter, derive expression for Shunt Resistance. 1. Define Voltmeter. How a galvanometer is converted into Voltmeter, derive expression for series resistance.
LONG Q/A	State Ohm's Law. Describe wheat-stone bridge, proved that for balanced wheat stone bridge $\frac{R_1}{R_2} = \frac{R_3}{R_4}$
NUMERICALS	**Textbook:** 15.1,15.2,15.3,15.5,15.7 **Past Paper:-**
CHAPTER NO.16 ‖ ELECTROMAGNETIC WAVES & ELECTRONICS	
SHORT Q/A	1. What is meant by conduction band and forbidden gap? Why does the resistance of a semiconductor decrease with temperature? 2. Define Transistor. Describe working of PNP or NPN transistor.
NUMERICALS	**Textbook: -** **Past Paper:** 2015 Q.2(xii)
CHAPTER NO.17 ‖ ADVANT OF MODERN PHYSICS	
SHORT Q/A	What is perfect black body? What are max plank's assumptions to explain black body radiations? Also write Plank's law of black body radiation.
LONG Q/A	1. State Postulates of Special theory of relativity. Explain its consequences. 2. What is Photoelectric Effect? Explain its important results. Also derive Einstein's photo-electric equation.

NUMERICALS	**Textbook:** 17.3,17.5,17.6,17.13,17.14,17.15 **Past Paper:** 2018 Q.2(xiv), 2013 Q.2(vi)
CHAPTER NO.18 || ATOMIC SPECTRA	
SHORT Q/A	What is meant by terms: Laser, Metastable state, population inversion, Stimulated emission, Optical pumping
LONG Q/A	i) State postulates of Bohr's Atomic Model. Derive expression for radius of nth orbit of hydrogen atom. ii) Derive expression for the following when $r_n = \frac{4\pi \epsilon_0 h^2 n^2}{m e^2}$ Wavelength of photon emitted in hydrogen spectrum
NUMERICALS	**Textbook:** 18.2,18.3,18.4,18.5,18.6 **Past Paper:** 2016 Q.2(vii), 2014 Q.2(x)
CHAPTER NO.19 || ATOMIC NUCLEUS	
SHORT Q/A	State and explain law of radioactive decay
LONG Q/A	1. Define Nuclear Fission and Nuclear Fusion. Explain Fission Chain Reaction. 2. Define Radioactivity. Show change in nuclei due to Alpha, Beta and Gamma emission.
NUMERICALS	**Textbook:** 19.4,19.6,19.7,19.10 **Past Paper:** 2018 Q.2(vi), 2016 Q.2(xiv)
CHAPTER NO.20 || NUCLEAR RADIATIONS	
SHORT Q/A	1. Give the construction and working of Wilson Cloud chamber. 2. Give the construction and working of Geiger Counter.